

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS

Applicant:	Xie, et al
Serial No.:	10/655,946
Filed:	9/4/2003
For:	An Apparatus for Optical Navigation
Group Art Unit:	2629
Examiner:	Sherman, Stephen

REPLY BRIEF FOR APPELLANT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This reply brief is filed in response to the Examiner's answer, dated 05/10/2007, to the appeal, dated 2/27/2007, of the final rejection in the above-identified patent application. This brief addresses only those arguments made in the Examiner's answer that were not part of the Examiner's arguments in the final rejection.

In response to Applicant's submission in the appeal that five of the limitations in the claims rejected by the Examiner as anticipated by Liou (and in the claims rejected by the Examiner as unpatentable over Liou in view of secondary references) were in fact not taught by Liou (or by the secondary references), the Examiner presents two new points.

First, with respect to the limitation requiring a single detector that acquires images of the surface at a specified rate, Applicant submitted in the appeal that the Examiner's argument appeared to be based on the premise that every device samples at a finite fixed frequency, and that this premise was clearly unfounded. In the Examiner's answer, the

Examiner defends that premise, stating that the Applicant did not present any examples of devices in which the output signal changes continuously in time rather than at a fixed frequency. Applicant must disagree. Applicant noted in the Brief that Liou teaches a device that operates as a conventional encoder. Such devices output a continuous signal derived from one or more photodetectors in which the signal switches states when an image that moves relative to the photodiode has an edge that moves over the photodiode. The output switches independent of any clock signal.

In addition, Applicant submits the following examples of sensors that operate without sampling a signal at a fixed rate: galvanometers, thermocouples, thermistors, and radiometers of various types, including simple camera exposure meters. In these cases, selected from a huge number of equally valid possibilities, an analog output signal is produced, which may, but certainly need not be, sampled or digitized by additional circuitry. Hence, Applicant maintains that the claim limitation requiring image acquisition at a specified rate does have a distinct meaning, which is not satisfied by the system taught by Liou. This limitation is required by claims 1, 2, 11, and the claims dependent therefrom.

Second, in response to Applicant's submission regarding claims 8 and 16, 6 and 14, 7 and 15, and 10 and 18 that the combination of Liou with the relevant secondary references would be either inoperable or disadvantageous because a grid pattern is necessary for Liou to work, the Examiner states that in the combination of references proposed, the Examiner now envisages the device of Liou being used with patterns other than a grid. However, the Examiner does not point to any operable version of the device of Liou that would work on a different pattern. As noted in the Brief, Applicant the device taught by Liou depends critically on a four-pixel photodiode sensor responding to a light pattern produced by the positioning of a grid pattern of specific line and spacing dimensions (see Figures 3 and 4). Absent such a grid pattern, the device of Liou does not operate without making additional changes. Hence, the device would not work on illuminated surfaces of the various types presented in the secondary references unless those surfaces were simply displaying that particular type of grid pattern, and nothing else. The Examiner suggests in the Examiner's answer that there would be cost and efficiency advantages in having a single device combining the position detector and display. However, the combination suggested by the Examiner is no more a "single device" than that taught in Liou. Applicant submits that as the

display would simply be replacing a cheap and simple grid pad and offering no other function, the combination would not confer the cost and efficiency advantages suggested. Applicant requests that Board take judicial notice of the fact that a CRT or LCD display is significantly more expensive than an illuminated transparency.

Third, with respect to the limitation requiring that two frames be formed, one of the frames to be shifted with respect to the other frame, and then a correlation value be computed, Applicant submitted in the appeal that the Examiner had not pointed to any shifting of frames. In the Examiner's answer, the Examiner points to the final rejection page 10 lines 5-11 in which the Examiner refers to the fact that the device is moved between the times that the two "images" are taken. The Examiner now explains that the Examiner interprets the movement of the device between the two "image" captures as being the "shifting" along the axis required by the claim limitation.

Applicant submits that the claim limitation in question clearly requires that the shifting of frames occurs after the frames have been acquired, as part of the determination of position change. Hence, Applicant submits that the interpretation taken by the Examiner does not satisfy this limitation, which is required by claim 20 and the claims dependent therefrom.

In response to Applicant's submission in the appeal that claims 4 and 21 should be allowed as Liou in view of Lauffenburger fails to teach a supplemental or additional light source, the Examiner adds two new points. One is the statement that the claims "do not require two light sources" and the second is the statement that the Examiner's interpretation rests on only one of the sources in Liou being used at a time, not both together. First, Applicant submits that the claims do require an illuminated surface **and** either a supplemental light source, as specified in claim 4, or additional illumination, in the case of claim 21. Second, as the Examiner admits in the Examiner's answer, the two sources in Liou could not be used at the same time, in the same embodiment, and hence, Applicant submits that Liou does not teach operation with both an illuminated surface and a supplemental source or additional illumination, as required by the claims.

Respectfully Submitted,

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Calvin B. Ward

Registration No. 30,896

Date: July 2, 2007

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